

REMARKS/ARGUMENTS

Claims 1-11, 14 and 16-18 are present in this application. By this Amendment, claims 1, 2, 4 and 16 have been amended, and claims 12, 13 and 15 have been canceled. Reconsideration in view of the above amendments and the following remarks is respectfully requested.

Claim 1 was rejected under 35 U.S.C. §102(b) over U.S. Patent No. 5,368,914 to Barrett. Without conceding this rejection, claim 1 has been amended to include the subject matter of claims 12, 13 and 15. Applicant thus respectfully submits that the rejection is moot. Withdrawal of the rejection is requested.

Claims 2-18 were rejected under 35 U.S.C. §103(a) over Barrett in view of U.S. Patent No. 5,186,999 to Brambach. This rejection is respectfully traversed.

One goal of the present invention is to provide an improved structural sandwich plate member suitable for use in constructing large structures, such as ships and boats, and that can provide additional blast or ballistic protection. To this end, the outer plates are made of metal and have a thickness greater than or equal to 3 mm, whilst the core has a thickness greater than or equal to 15 mm. The structural sandwich plate member of this construction is particularly strong and capable of providing significant structural strength to structures made of it, rather than a mere skin, and functions as a composite body because the core member is bonded to the outer plates with sufficient strength to transfer shear forces therebetween. The interlayer provides additional strength in the event of blast or ballistic impact and assists in holding the sandwich plate together in such events. Applicant respectfully submits that the prior art falls short of such a structure.

Barrett discloses a vibration damping material which comprises a viscoelastic material 10 sandwiched between two outer structural layers 12 and 14 of stiffness material. An additional

inner layer of stiffness material is fixed to one of the outer layers at one end whilst its free end extends into the viscoelastic material to improve transfer of vibrations into the viscoelastic material. An example described at col. 4, lines 31-65 proposes that the outer layers be of laminate composite and have a thickness of 36 mils (equivalent to 0.9 mm), whilst the viscoelastic material is an acrylic polymer film which is formed in two layers, each of thickness 5 mils (equivalent to 0.13 mm). The inner stiffness layer is formed of one or more plies of graphite-epoxy, having a thickness of 5 mils (0.13 mm). Thus, the total thickness of the laminate is 87 mils, equivalent to 2.2 mm. If the composite layers were replaced by metal layers, the skilled person would expect to use much thinner layers in order to achieve the same strength.

It is thus clear that Barrett describes a lightweight laminate, perhaps suitable for use in cars or as an outer skin for aircraft. As such, Barrett lacks any disclosure or suggestion to modify its laminate to meet the structural characteristics suitable for the construction of substantial structures such as ships or boats and to provide ballistic protection. The laminate according to the claimed invention has a total thickness of greater than 21 mm, which is an order of magnitude greater than that described in Barrett. Such an increase in layer thickness does not represent a mere adjustment of the thicknesses of Barrett but a completely different structure, with different structural characteristics, and suitable for entirely different purposes. It is also to be noted that nothing in Barrett discloses or suggests that the described laminate would have any explosive or ballistic strength, and the skilled person would not consider that the described arrangement would be likely to withstand explosive or ballistic loads. Nothing in Barrett teaches that increasing the thickness of the layers would increase resistance to explosive or ballistic loads. Accordingly, there is no motivation to the skilled person to modify the laminate disclosed in Barrett to arrive at the presently claimed invention.

Brambach does not provide any teaching or suggestion to correct the above-described omissions in the disclosure of Barrett. The outer layers of Brambach are of thermoplastics synthetic plastic material reinforced with fibers, not metal. Also, the only mention of suitable thicknesses of the panels of Brambach are at col. 5, line 20 and at col. 6, line 10. The total panel thicknesses mentioned there are 8 mm and 5 mm respectively, both significantly smaller than the minimum panel thickness of the present invention. Brambach does not disclose a structural sandwich plate member having structural characteristics suitable for use in constructing large structures such as ships and boats. The described laminates are apparently structurally configured for use in air, space and transport applications (col. 1, lines 15-16) where being lightweight is the most important desired characteristic. There is also no disclosure or suggestion of providing structural characteristics that effect improved ballistic protection.

As noted above, claim 1 has been amended to include the subject matter of claims 12, 13 and 15. In particular, claim 1 has been amended to define structural characteristics of the structural sandwich plate member such that the plate member is suitable for the construction of substantial structures such as ships or boats and to provide ballistic protection. Independent claim 16 has been similarly amended and defines related subject matter in a method of manufacturing the structural sandwich plate member. Since at least these features of the invention are lacking in Barrett and Brambach, taken singly or in combination, Applicant respectfully submits that the rejection of independent claims 1 and 16 is misplaced. With regard to the dependent claims, Applicant submits that these claims are allowable at least by virtue of their dependency on an allowable independent claim.

Reconsideration and withdrawal of the rejection are respectfully requested.

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In view of the foregoing amendments and remarks, Applicant respectfully submits that the claims are patentable over the art of record and that the application is in condition for allowance. Should the Examiner believe that anything further is desirable in order to place the application in condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

Prompt passage to issuance is earnestly solicited.

Respectfully submitted,

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